Assignment 2

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Task 1

Functions

readImages : Reads images with color from specified path by PIL library.

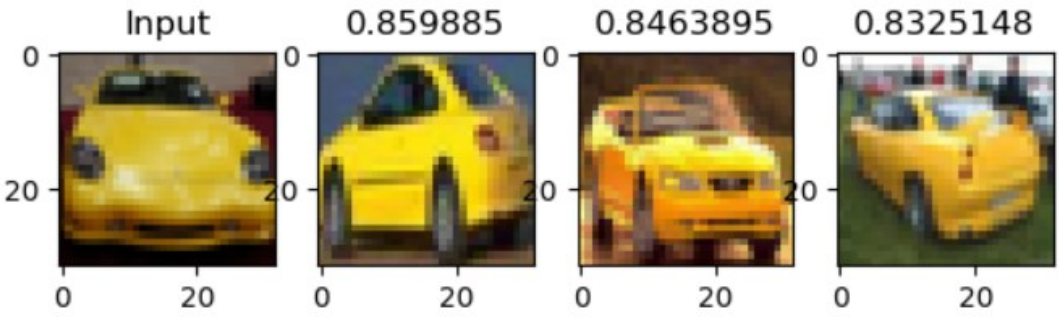
cosine_similarity: Converts two input images to vectors. Calculates similarity by using cosine similarity formula.

getSimilarityList: Returns the name and similarity scores of n images that give maximum similarity.

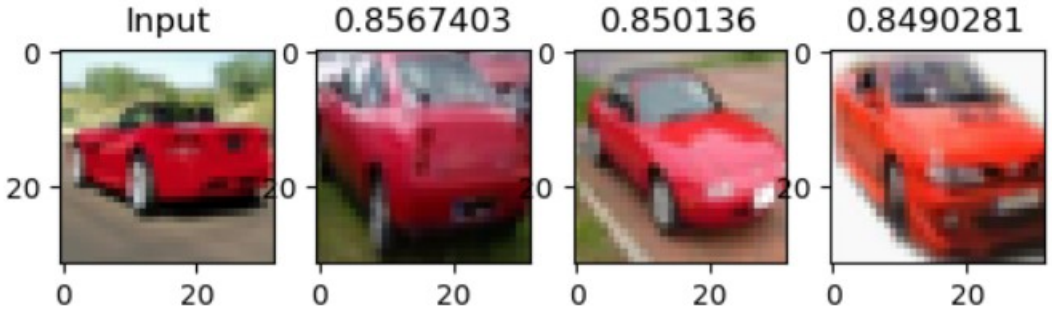
plotSimilarity: Plots a graph by given similar images.

Tasks

a) What will be the output for this input (**Input:** 4228.png)?



b) What will be the output for this input (**Input:** 3861.png)?



Task 2

Functions

entropy : Calculates entropy score by using target (class) values of specific column value (in type of pandas Series). (Ex. Input is ‘older’ and ‘younger’ for the column age in the given data set)

gini: Calculates gini score by using target (class) values of specific column value.

entropy_weighted: Calculates weighted entropy score for non target column input and entropy score of overall collection for target column input.

gini_weighted: Calculates weighted gini score for non target column input and gini score of overall collection for target column input.

Tasks

a) Compute the E and GI f or the overall collection of training examples.

```
E:  1.0
GI:  0.5
```

b) Compute the E and GI for the age attribute.

```
E:  0.5916727785823275
GI:  0.24489795918367352
```

c) Compute the E and GI for the cp attribute.

```
E:  0.37123232664087563
GI:  0.13265306122448983
```

d) Compute the E and GI for the trestbps attribute.

```
E:  0.9007930640987629
GI:  0.4331550802139036
```

e) Which attribute is better according to calculations?
We see that gini index and entropy of cp are lower than other attributes. So cp is better than others.

f) Which attribute can be chosen as the root ? Explain why.
Cp can be chosen as the root. Because it has the lowest gini and maximum information gain score among the other features.

Information Gain

```
IG:  Age:  0.4083272214176725  Cp:  0.6287676733591243  Trestbps:  0.09920693590123708
```